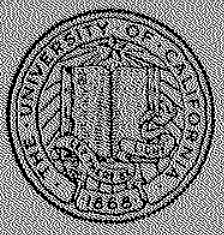
UNIVERSITY OF CALIFORNIA INSTITUTE OF MARINE RESOURCES

THE SCRIPPS INSTITUTION OF OCEANOGRAPHY MARINE TECHNICIANS HANDBOOK:

THE CURATING OF MARINE GEOLOGICAL SAMPLES

William Riedel, Phyllis Helms and Thomas Walsh



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MARINE TECHNICIAN'S HANDBOOK

Series Chapters Available to Date

February 1973

GENERAL INTRODUCTION

This publication is one of a series intended to provide explicit instructions for the collection of oceanographic data and samples at sea. Individual chapters are being issued separately so that they may be available as they are prepared and may be replaced by updated versions without replacing the entire series. It can, therefore, be considered as an open-ended "marine technician's handbook".

For many years there have been such manuals in existence within the various groups at the Scripps Institution of Oceanography for internal use. These manuals are being updated, and new ones are being prepared where no satisfactory ones existed; they will be issued as they are ready.

The instructions on physical, biological, and chemical oceanographic data collection and processing have been prepared by members of the Data Collection and Processing Group (DCGP), part of the Marine Life Research Group of Scripps. They cover procedures used by that group. Other chapters on goelogical and geophysical techniques are based on the "Marine Technician's Handbook" series originally prepared by Mr. Frederick S. Dixon, and issued by the Oceanic Research Division some years ago. It is expected that chapters on techniques used by other groups within Scripps will be added.

Since the sections will be published individually, there will undoubtedly be some repetition. This should not detract from the overall purpose of the manual, since it is expected that a single section will be the only one needed for a particular operation. We do not wish to suggest that the methods described here are the only methods; we have merely attempted to describe the methods and procedures which we use and which we have found to be reliable and up-to-date. As new information becomes available, attempts are made to test techniques, incorporate them into routine procedures, and then revise the chapter concerned.

In the final analysis the reliability and quality of the data obtained is in your hands. It is imperative that meticulous attention be given to details to insure reliability and usefulness in the results you obtain.

While we have attempted to be thorough in descriptions of techniques, this cannot be considered to be a complete "cookbook" for the novice. It is in most cases assumed that the reader has some prior knowledge and training in the field con-

cerned. We hope, however, that these instructions can serve as a training aid for the novice marine technician, a "cookbook" for the scientist who is taking his own observations, and a reference manual for the experienced technician.

Preparation of these chapters over the years has been supported by the University of California and by grants and contracts from the many federal agencies to the Scripps Institution of Oceanography and to the Institute of Marine Resources. Support for this more complete and revised manual has come from the National Sea Grant Program. This chapter, The Curating of Marine Geological Samples, is a revision of an earlier manual, The Curating of SIO's Geological Collection, prepared for Scripps scientists by the present authors, W. R. Riedel, Phyllis Helms, and Thomas Walsh.

G. G. Shor, Jr.
Sea Grant Program Manager

The Curating of Marine Geological Samples
February 9, 1973

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THE CURATING OF MARINE GEOLOGICAL SAMPLES

INTRODUCTION

The procedures described in this manual are those that have been developed through long and varied experience by the personnel of Scripps Institution of Oceanography; they are offered as guides to persons involved in geological research at sea. The essential procedures included here cover those used for the protection and utilization of the geological collections. Specifically they consist of the processes used at Scripps for labeling and care aboard ship and ashore, sampling, sufficient description, and the handling of significant information associated with their collection and investigation. Other institutions will adapt these to their own purposes. It should be noted that, in any institution or system, procedural changes will evolve through experience; but it is recommended that each system take care to see that any changes introduced be internally consistent with current practice within its institution. This is accomplished at Scripps through discussions of potential changes with the appropriate curator or curators before incorporation into the existing system.

"OWNERSHIP" AND PRIOR CLAIM

Expeditions from Scripps are mounted by the Institution as a whole; the burden of planning and shipboard work, however, is carried by a relatively few scientists and technicians. Successive Directors of Scripps have reaffirmed the policy that samples and data collected by expeditions are the property of the Institution and that the responsibility for care and distribution of these samples and data has been laid upon curators (see Appendix A, example as followed at Scripps). This curatorial policy and its resulting procedures have proven valuable in ensuring that all geological materials collected on the institution's expeditions benefit far more researchers than those involved in the collecting expedition, and that the collections become increasingly comprehensive and useful over the years.

Generally the question of the prior right of the collector to use the materials does not arise. Shortly after the collection reaches the institution and is turned over to the proper curatorial staff, the collector uses minimally sufficient samples of the cores or dredged rocks to satisfy his own research purposes. The materials are then made almost immediately available to other researchers (both inside and outside the institution) who wish to use them.

Occasionally, however, the collector wishes to restrict access to the materials until he has had an opportunity to publish on them. The length and conditions of the period of restricted access then is worked out with the curator of the collection. As soon as the collecting cruise is completed, details of the collected material and, generally, the materials themselves should be turned over to the curatorial staff. The staff then takes appropriate steps to ensure that access to these particular materials is restricted for the interval of time agreed upon. During this period of restricted access, inquiries regarding the materials are referred to the collector.

As a rule, the curatorial staff tries to dissuade an investigator from using more than half of the material remaining in the working half of any specific interval in a sediment core. Hopefully, his needs can be satisfied by a narrower sample extending over a longer interval of the core. When an individual plans to use a major portion of a sediment core for one investigation, he should see that a duplicate core is taken at the same locality for general use.

AIMS OF THE CURATORIAL STAFF

The geological curating staff attempts to:

(1) keep samples in good condition, uncontaminated, and accessible to competent researchers, while preventing any waste;

(2) provide lists of available samples, together with an initial description of each core and dredge haul;

(3) keep track of at least the existence (but not necessarily the substance) of unpublished and published results of research on samples from the institution's geological collections.

Methods employed toward accomplishing these aims are described in the pages that follow.

Avoidance of Contamination:

Many types of investigations of geological samples involve the recognition, measurement and interpretation of elements, minerals or microfossils which occur in minute quantities in sediments or rocks. A small amount of one sample accidentally mixed with another sample, from a dif-

ferent locality or from a different level in the same core, will inevitably lead to faulty interpretations later. It is essential, therefore, to take every precaution against contamination, both at sea and ashore.

Naming Expeditions and Abbreviating Names for Labels:

Expedition names and sample numbers are the means by which all results are referred to and tied together. It is therefore of the utmost importance that reliable procedures are followed.

Great confusion has resulted in the past from the practice of designating one or two legs of a cruise by a name that differs from, and is often in the middle of, the rest of the expedition. This has caused an unnecessary proliferation of names. (See Appendix B for examples of expedition names, with abbreviations.) One name should be used and recognized for an entire cruise (i.e., home port to home port) regardless of the number of ships involved. On a multi-ship operation, samples collected by one vessel are distinguished from those collected by another vessel by the initial letter(s) of the ship's name following the abbreviation of the expedition name.

In naming expeditions and abbreviating such names for labels, it is important to avoid any possibility of confusion with material collected earlier. As noted above, Appendix B lists Scripps' and other expeditions - with their abbreviations - that have collected geological samples. Cruises having to do with the sea floor should have a name and abbreviation that cannot possibly be confused with any of these. An abbreviated designation of three or four letters is preferable to a two-letter combination, since the latter could be ambiguous.

SHIPBOARD LABELING AND RECORDS

Numbering of samples should be consecutive aboard one ship throughout an expedition, except that piston cores and their accompanying gravity cores will carry the same number (e.g., 21PG, 21P) even though several types of samples are obtained on a single station or though there is more than one attempt to obtain a single type after one or more failures.

Designation of sample type should follow the sample number; e.g., 29G; 30PG, 30P; 31D; 32FF; 33Bx, etc.

Measurements of cores, weights of rocks, depths of water, etc., should be given in metric units.

CORE LOG FORMS

A Core Log Form should be completed aboard ship for each sampling attempt, whether or not a sample is obtained. Examples of properly completed forms, as used by Scripps Institution of Oceanography, are included in Appendix D.

The completed forms are used ashore to compile a catalogue ("core log") of all geological samples taken on an expedition. Some of the information required is available only at the time of sampling; therefore every effort should be made to enter such data at that time. Items of information that must be recorded at sea are: expedition and ship names, sample type and number, date, echo depth (in fathoms), times of start down, on bottom and on deck, length and/or size of sample. All times should be logged in Greenwich Mean Time (Z). The other items on the form should be filled in whenever appropriate and possible.

Aboardship latitude and longitude can be only approximate at best, regardless of the navigation method. Locations of samples are therefore taken from the smooth plots of the ship's track which are compiled ashore. Depth corrections are carefully checked at the time the catalogue is compiled and are recomputed where necessary.

WRITING MUST BE LEGIBLE. Misspelling and grammar are easily corrected, but only if handwriting can be deciphered. Since these forms are also Xeroxed on occasion, it is desirable to use a writing instrument that Xeroxes well (e.g., an H series or other hard pencil does not show up well when reproduced).

SHIPBOARD CORE HANDLING

Gravity Cores:

After the core has been obtained in its plastic liner, the water above the sediment should be removed. This can be done by using a syringe or by boring a hole in the liner immediately above the sediment surface. After the water is removed, the plastic liner is cut as closely as possible to the top of the sediment. Throughout its handling and storage, the gravity ore should be kept vertical, with the sediment surface end up. The ends of the liner must be capped and taped securely, as described for piston cores. Objects such as manganese nodules or shark teeth should not be removed from the core for separate storage since this increases their chances of becoming lost.

Marking the Liner: An arrow and the word "TOP" should indicate the upper end. The label on the core should identify it without any ambiguity. Scripps researchers traditionally write first the abbreviated expedition name (LSD, MSN, etc.), then the initial of the ship if the expedition involves more than one vessel and samples are obtained aboard for both (i.e., A for Argo, H for Horizon, etc.). The number of the core and an indication of the type of core follow (P for Piston, G for Gravity, C for Camera, etc., as shown in Appendix C). These markings should be carefully inscribed in the plastic liner by means of a vibro engraver or small soldering tip. For greater security, the labels should be repeated in water-proof ink with a felt-tipped pen; but this latter method should not be used alone since such markings are often rubbed off in transit. (Note: Some types of felt-tipped pens do not contain waterproof ink.)

Gravity cores in their liners should be stored vertically, top-end up in a cold room, a few degrees above freezing. Cores must not be allowed to freeze.

The bottom end of a core that is removed in the core-catcher and the core-nose should be stored separately in a well-sealed container. The label should include the words "catcher sample" and should coincide with the identifying designations inscribed on the core of the same sampling. Catcher and core-nose samples must also be marked in a manner which ensures that the label will not rub off. Pencil on masking tape and waterproof ink on the plastic container work well. Note: If a gravity core is too long to be stood upright in the cold room available, it should be cut, usually with a 100 cm top section, and both sections properly labeled with appropriate notes made on the core log sheet.

Piston Cores:

These long cores should be cut into 150 cm sections (or the length required by the research institution involved), beginning at the bottom of the core. The ends of each section are sealed with caps and vinyl plastic electrical tape (such as "Scotch" Brand #33), and the core sections are stored horizontally, except as follows:

When there is water above the core - and there usually is - the top section should be stood on end for one or more days until quite settled and until the water may be drained and the excess liner cut off. If there are water pockets within the core, the section(s) involved should be kept horizontal and extreme care exercised in handling to prevent mixing by agitation. Any water may be drained off, slowly, by means of small holes bored through the liner and

afterward resealed. If there is a complete gap in the sediment in a core section, the empty section of liner should be cut out. It need be of no concern that sections shorter than 150 cm may result, so long as proper care is taken in labeling. (Note that GRAVITY cores are stored VERTICALLY and PISTON cores are normally stored HORIZONTALLY.) Before cutting the core into 150 cm lengths, it is highly desirable to inscribe a distinctive longitudinal mark along one side of the liner - unless factory-scored liners are used - so that sections can be oriented with respect to each other for paleomagnetic measurements.

Each section should be labeled twice with a vibro-engraver or thin soldering tip. The two labels should be on opposite sides of the liner so that one label will be on the working half and the other on the archive half when the core is split longitudinally ashore. The sections should also be labeled with a felt-tipped pen using waterproof ink.

If there is more than one section, the section number should be included in Roman numerals, as the sections come from the core barrel. "Sect. I" is always the bottom of the core, even if physical difficulties should dictate removal of the core through the top of the barrel, and should be noted on the log sheet thus:

Section I (Bottom of Core), 150 cm
Section II, 150 cm
Section III, 48 cm

This core, then, would be 348 cm in length. The top section is usually less than 150 cm. An arrow should be drawn to indicate the top of each section.

WAH 7P
Sect. I (Bottom of Core)
150 cm (or 198-348 cm)

If it is desirable to include section depths on the liner, the labels of the core sections should indicate the depth below the sediment surface, and never the distance from

the bottom of the core. Thus, Section III on the above example would be "0 - 48 cm" and Section I would be "198 - 348 cm". Any deviation from this method of marking the sections should be clearly indicated, both on the core sections and in the core log.

Abbreviations for the labels of piston cores are the same as those described for gravity cores.

Dredge Hauls:

Rock dredge samples are usually of such size that they must be stored in gunny sacks, or in wooden boxes of a standard size to fit the shelves in the shore-based rock storage area. The label for each haul should be clearly written in pencil or waterproof ink on cloth labels, one of which is placed inside the sack with the other attached to the outside. The letter D, placed after the sample number (and the abbreviation of the expedition) is used to designate dredge hauls. Dredged sediment should be stored in plastic buckets or freezer boxes, depending upon the sample size, and should be clearly marked with waterproof ink on both the container and a permanently attached label. Masking tape is suitable for the latter.

ARRIVAL OF EXPEDITION COLLECTION AT SHORE RESEARCH FACILITY

The sediment cores and dredge hauls, with completed shipboard log sheets, should be turned over to the geological curating staff immediately upon arrival ashore. Under special circumstances, expedition collections may remain for a time in the custody of the collector in order to protect his prior rights for research. (See section on "Ownership and Prior Claim".) It is important, nevertheless, that the original log sheets become part of the curatorial records without delay.

As soon as possible, sediment cores are split for description and sampling, and dredged rocks are made available for thin sectioning and analysis. With a small curatorial staff, a bottleneck can occur at this stage. If, however, the collector provides manual assistance in the preparation of the materials, this problem can be eased.

Also as soon as possible after the return of an expedition, the curatorial staff prepares for circulation a list of all cores and dredge hauls collected on that expedition, with a chart of approxiamte locations and photographs of the cores. The principal causes of delay in the issuance of these sample lists are staff work load and/or the quality of cooperation of returning scientists or technicians in getting pertinent and correct data to the curatorial staff concerned, within a reasonable time.

These sample lists are not delayed until reliable sample descriptions are available. The information they contain concerning the nature of the materials is, therefore, that which is recorded after only a cursory visual inspection on board ship.

Working Core and Rock Descriptions:

The preparation of useful working descriptions of geological samples is a part of the curatorial function. The objective is to make available sufficient information to permit specialist investigators to determine which samples in the collections are most suitable for their specific purposes.

In the case of sediment cores, this includes a visual description of the sediment sequence, core photographs, lithology determined from smear slide examination, and paleontological age determination. Examples of the forms currently used at Scripps Institution for recording these data are included in Appendices E and F.

If collectors or subsequent investigators of cores need to make their own core descriptions, and wish to do this in standardized format, the curating staff of the research institution should make a sufficient supply of forms available.

If the geological curating staff does not include competence in hard-rock geology, reliance is placed upon the collector or other investigators for the initial descriptions of most dredged rocks.

SAMPLING FOR RESEARCH

Except for those instances in which access may be temporarily restricted, samples from all cores and dredge hauls are available to competent researchers. The curatorial staff should exercise only those controls necessary to ensure that material is not wasted and that materials continue to be useful for as many years as possible.

One-half of a longitudinally split core is designated as its "working" half and the other as the "archive" half. The archive half is not sampled until the working half is depleted, commonly five to ten years. As mentioned earlier, the curatorial staff generally tries to dissuade any one investigator from using more than half of the material remaining in the working half of any specific interval in a sediment core. His needs can usually be satisfied by a narrower sample extending over a longer interval of the core. The same principle of refraining from using more than half of a remaining sample is applied, where possible, to dredged rocks, nodules, etc.

Whenever cores (and when practical, rocks) are sampled, this must be done under the supervision of one of the curatorial staff. Experience has shown that this is the only way to ensure that valuable materials remain suitable for later investigations.

A procedure instituted at Scripps records the recipient and purpose of each sample taken and the location of any results (see Appendix G). Thus, later investigations of a previously examined core need not begin in a vacuum. The success of this practice, however, depends upon all researchers informing the Curator of the existence of published and unpublished results. (Ideally, copies of preprints, reprints, or duplicates of results should be supplied to the Curator so that he may be informed as to which of the institution's samples have been analyzed, and for what content.)

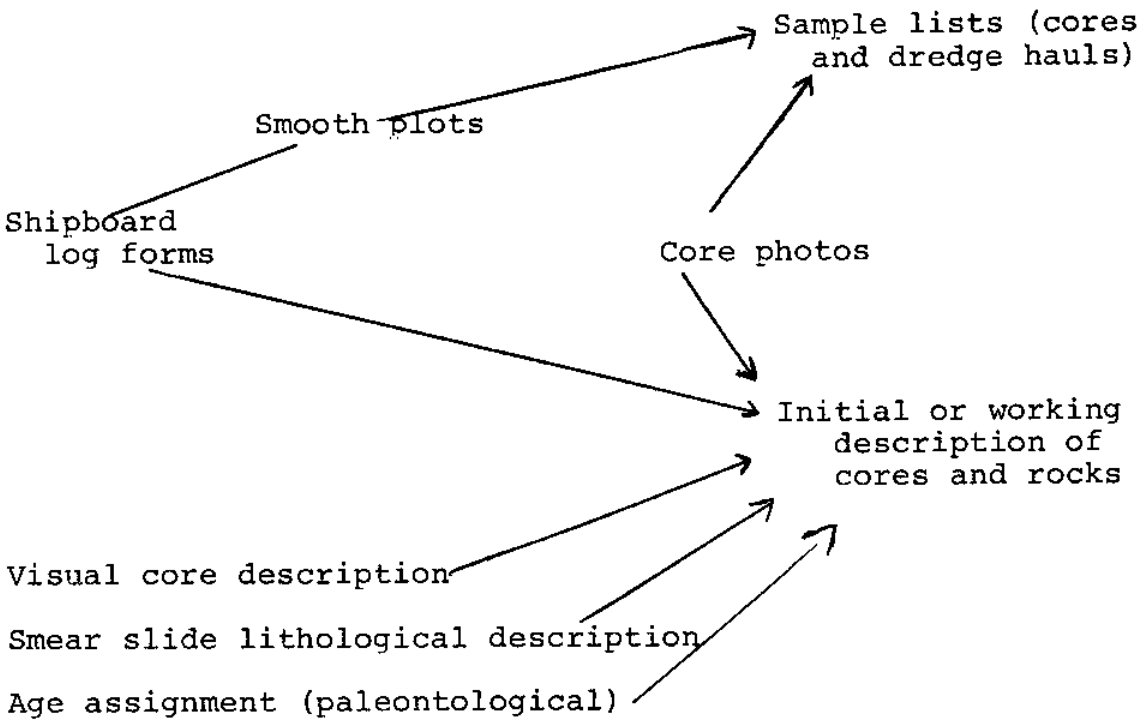
Thin-Sections of Hard Rocks:

Scripps Institution has long provided for its staff the services of a rock sectioning laboratory. Generally, two thin-sections can be made from a hand specimen with little more effort than one requires. The Institution therefore is prepared to store a thin-section and hand specimen corresponding to all thin-sections of dredged rocks that are prepared for

individual investigators. In this way, the rock collection will increase in value for a large number of future researchers. If the collector so desires, access to these sections and specimens can be temporarily restricted.

INFORMATION SYSTEM

The elements of the curatorial information system can be summarized as shown below:



Record of subsampling and investigations.

The guiding principle in setting up such a system is the need to provide general information of the greatest use to the largest number of researchers. As far as the details are concerned, this manual emphasizes the recording of fundamental information rather than interpretations.

Where funds are available, the most efficient method of handling and disseminating the "working description" and record of investigations would include not only

the use of the original sheets filed in the Curator's office, but also recording data on magnetic tape for computer retrieval and manipulation. Where tape storage is not possible, the need for full and available information for the Curator's office becomes essential.

IDENTIFICATION OF SAMPLES IN PUBLICATIONS

Investigation of a sample from the geological collections benefit when the investigator can easily locate the results of previous investigations on the material. For this and other reasons, therefore, it is highly desirable that authors of papers give samples the standard designations (expedition abbreviation, sample number, etc.) as indicated in the duplicated sample list (core logs). Should an author wish to give the samples used a different designation, this should be in addition, rather than as a substitute for, the standard one.

APPENDICES

APPENDIX A

Disposal of Samples and Data

Observations and samples taken on Scripps expeditions are of interest to more persons than those actually participating in the research cruise. Some of these records and data are not of immediate concern at the time of collection, but prove to be of great value at a later date. In order to safeguard such information and samples, a system of curatorships - both formal and informal - has been established at the Institution. Samples and data should be delivered to the appropriate curators, even if the person who acquired the samples wants to check them back out immediately for his own work.

An up-to-date list is available of the individual curators, with office addresses, telephone extensions, and the type of material assigned to the care of each. Ships' logbooks are permanently stored in the Scripps library after being checked when the vessels dock at home port.

Several equipment pools are maintained at the institution to facilitate data collection. These include physical and chemical oceanographic equipment, dredging and coring equipment, cameras and pingers, plankton nets and related biological collecting equipment, and reflection profiling equipment.

For each cruise a statistical summary is prepared for the National Oceanographic Data Center and a cruise report is prepared for local use and for submission to the United States and concerned foreign governments.

APPENDIX B

Names of Expeditions and Their Abbreviations

Aransas Bay (A) *
Arroyo Colorado (AC) *
Acapulco Geological Exped. (AGE)
Gulf of Mexico (Fish and Game Comm.) (AJ) *
Albatross (ALB)
Alert
Amphitrite (AMPH)
Antipode (ANTP)
Argentine Antartic Exped. (Argent. AE)
Arguello (Arg) or (ALO)
Aries (ARES)
Atlantis
Australian Antartic Exped. (Aust. AE)
Barataria Bay (BAR) *
(BB)
Bache
BANZARE
Baptiste Collette (Miss. Delta)
Beach and dune samples, Baja Calif., 1958 (BCN)
Baffin Bay (BF) *
Blue Flash
Bonacca (BON)
Brazos River Delta (BRAZOS) *
Breton Island (Miss. Delta) (BI)
Breton Sound (Miss Delta) (BS)
Copano Bay (C) *
Calcasieu Lake (CAL) *
Calcasu River *
Cameron (CAM)
Capricorn (CAP)
Carmasel (CRM)
Carnegie (Carn)
Carrousel (Carr)
Cascadia (Cas)
CATO
Challenger (Chall)
Champerico (Cham)
Chinook (Ck)
Chubasco (Chub)
Chandeleur Island (Miss. Delta) (CI)
CIRCE
Climax (CLMX)
Colorado River (CR) *

* Samples from the west coast of the Gulf of Mexico.

Names of Expeditions and Their Abbreviations (cont'd)

Criss-Cross (Criss-X)
Cusp
Discoverer
Discovery
Dodo
Dolphin
Downwind (DW)
DWC
Equatow (EQUT)
Espiritu Santo Bay (E) *
East Coteu Blanche (ECB) *
Emery - Niino (EN)
Fanfare (Fan)
Samples off So. Calif., 1938 (FPS)
Frondoleg Island (FR) *
Guadalupe Delta River (G) *
Galveston Bay (GB) *
Gosier Island (Miss. Delta) (GI)
Gulf of Mexico (Miss. Delta) (GM)
Grand Isle (GR) *
Green Lake (Green) *
Gulf Oil (open gulf) (GJ) *
Guide
Hannibal (Hann)
H. M. Smith (HM Sm)
Hilo
Holly Beach (HB) *
Hodge-Podge (Ho or HP)
Humble *
Hypogene (HYPO)
Iguana (IGUA)
Open Gulf (J)
Japanyon (JYN)
Leapfrog (LFG)
Lavaca Bay (L) *
La Jolla Bay (LJ)
Laguna Madre (LM) *
Lusiad (LSD)
Mendocino (MEN)
Mesquite Bay (M)
Merzipan
Magnolia *
Mag Bay
Matagorda Bay (MB) *
Mustang Island (MI)
Mission Bay (MiB) *
Mud Lake (ML) *

Main Pass (Miss. Delta) (MP)
Mid Pac (MP)
Matagorda Island (MT) *
Matagorda Peninsula (MTP) *
Monsoon (MSN)
Mud Island (MUD)
Mukluk (MUK)
Naga (Not abbreviable)
Nueces Bay (N) *
Nanook
Newport Bay (NB)
Nero
NEL - Guadalupe (NEL-G)
NEL - Hawaii (NEL-H)
Norseman
Northern Holiday (Nth Hol)
Nova
Padre Islands (P or PI)
Papagayo (Papa)
Padre Inlet *
Pifan (inc. Montcan) (PIF)
Pioneer
Pass a Loutre (Miss. Delta) PL
Proa
Redfish Bay (R) *
Rio Grande (RG) *
Risepac (RIS)
San Antonio Bay (S) *
Sabine Lake (SAB) *
Sargent Beach (SB) *
SCAN
Seven Tow (7TOW)
Shell Oil *
Show
SIGRE
St. Joseph Island (SJ) *
Navy Radio and sound Lab. (SL)
Southern Borderland (SOB)
Southtow (SOTW)
South Pass (Miss. Delta) (SP)
Shoal Water Bay (SW) *
Styx
Swan Song
Swedish Deep-Sea Exped. (Swed. or SDSE)
Tiptow (TPTW)
Turtle Bay (T) *
Tethys (TET)

Names of Expeditions and Their Abbreviations (cont'd)

Texas A. & M. (TAM)
Tow-Mas (TWMS)
Traylor Island (TI) *
Toro
Tuna Oceanography II (TO-II)
Transpac (TP)
Tripod (TRIP)
Tuscarora (Tusc)
U.S.C. & G.S. Expedition 60 (Exp.60)
Vermilion Sea (VS)
Vettor Pisani (VP)
Vizcaino Bay (VIZB)
Wahine (WAH)
Western Gulf of Mexico-Stetson (WGM)
Wigwam (Wig)
William Scoresby (WS)
Yoyo (Yo)
Zapotek (ZAP)
Zephyrus (ZEPH)
Zetes (ZTS or unabbreviated)

APPENDIX C

Sample Abbreviations

Dart		
F or FF	-	Free fall core
G	-	Gravity core
GO	-	Oriented gravity core
PG	-	Trip gravity core, taken simultaneously with piston core
P	-	Piston core
V	-	Heat flow core
H	-	Core on hydrographic cast
PBS	-	Phleger Bottom Sampler (or Phleger corer)
T	-	Triple core
C	-	Camera core
Bx	-	Box core
D	-	Dredge, whether chain or pipe
S	-	Snapper
Grab		

APPENDIX D

Sample Core Logs

Station Number
(if stations are numbered)

SIO CORE LOG

Expedition Necessary

Ship Necessary

Lat.

Long.

Bathymetry

Sample No. Necessary

Date Necessary

Fathogram No.

DEPTH

Echo Fm

Correction Corrected Echo Fm M

Total wire out at bottom contact M

TYPE OF SAMPLE
Necessary

Piston

Trip Gravity

Gravity

Hydrographic PBS

Other

TIME: Start down Necessary

On bottom

On deck Necessary
(unless equipment or sample is lost)

Description of sample General: At least color of core and any changes down the core visible through liner (e.g., "dark brown clay"; "white ooze"; "gray-green mud above, coarse black sand below", etc.)

Length or size of sample In metric units. Core lengths always in centimeters. For piston cores, bottom section is Sect.I. Note any deviation on log sheet.

Catcher sample Yes or no. Number of containers if more than one.

Preservation

Remarks: (where appropriate--weather, accidents, defective equipment, recovery of equipment, other operations at stations, etc.)

Usually this space is used to note reason(s) for sample not being obtained; type of damage to or loss of equipment; course and speed when dredging, etc.; or disposition of sample if it is especially taken for personnel outside of research institution or for non-geological purpose, etc.; and will therefore not be placed in institution's geological collection.

Sta. 143

CORE LOG

Expedition DODO

Ship R/V Argo

Lat.

Long.

Bathymetry East side of Mid-Indian Ocean Rift.

Sample No. 143D

Date 20 Sept. 1964

DEPTH

Echo 2220-2100 Fm M

Correction 59-54 Corrected Echo 2279-2154 Fm 4167-3939 M

Total wire out 5675 Fm M

Pull Out Fm M

TYPE OF SAMPLE

Piston

Trip Gravity

Gravity

Dredge Chain

Other

TIME:

Start down 0858

On bottom 1035

On deck 1425

Description of sample Basalt boulders mostly weathered, coated with manganese crust, plus some smaller Mn nodules. Several kinds of basalt seem to be present, some quite coarse-grained.

Length or size of sample Full dredge (8 burlap bags)

Catcher sample?

Condition of sample

Remarks: (where appropriate--weather, accidents, defective equipment, recovery of equipment, other operations at station, etc.)

Dredging cse 060° - 65 rpm

Quite a few good hook-ups

Sta. 7

CORE LOG

Expedition WAHINE

Ship R/V S. F. Baird

Lat.

Long.

Bathymetry

Sample No. WAH 7P

Date 9 March 1965

DEPTH

Echo 2652 Fm M

Correction 78 Corrected Echo 2730 Fm 4992 M

Total wire out 5228 Fm M

Pull Out Fm M

TYPE OF SAMPLE

Piston X

Trip Gravity

Gravity

Dredge

Other

TIME:

Start down 1148

On bottom 1242

On deck 1500

Description of sample Upper 350 cm moderate brown radiolarian clay, bottom 178 cm. calcareous ooze.

Length or size of sample * 528 cm: Section I (bottom of core), 118 cm; Sect. II, 150 cm; Sect III, 150 cm; Sect. IV, 110 cm.

Catcher sample?

Condition of sample

Remarks: (where appropriate--weather, accidents, defective equipment, recovery of equipment, other operations at station, etc.)

* May also be noted thus: Sect.IV, 0-110 cm; Sect. III, 110-260 cm; Sect. II, 260-410 cm; Sect. I, 410-528 cm.

CORE LOG

Expedition ARMCHAIR, Leg IV

Ship R/V D. Jones

Lat. _____

Long. _____

Bathymetry Soft bottom - double echo

Sample No. ARCH 56G

Date 29 Feb. 1968

DEPTH

Echo 1134 Fm _____ M

Correction ____ Corrected Echo _____ Fm _____ M

Total wire out _____ Fm _____ M

Pull Out _____ Fm _____ M

TYPE OF SAMPLE

Piston _____

Trip Gravity _____

Gravity X

Dredge _____

Other _____

TIME: Start down 0000

On bottom 0033

On deck _____

Description of sample No core

Length or size of sample

Catcher sample?

Condition of sample

Remarks: (where appropriate--weather, accidents, defective equipment, recovery of equipment, other operations at station, etc.)

Heavy seas, ship rocking fore and aft. Winch broke, hydrographic wire parted, corer lost.

PISTON CORE LOG

Date 5 May 1971
Expedition ANTIPODE
Ship R/V MELVILLE
Position: Latitude 12°33.1'N } 0732 Z Sat Fix Good
Longitude 87°39.8'E }
General Area or Location "Franz Joseph Emmel" Channel (?)- Bengal Fan

TIME: Start down 0642 Z
On Bottom 0737 Z (wire at contact 3273 m)
Pull out 0737½ Z (3262½ m)
On Deck 0842 Z
Wire Tension at pullout 9000 lbs.
TOTAL Wire out 3275 m.
DEPTH: Echo 1723 fm.
Correction 44 fm.
Corrected 1767 fm. 3231 m.

Core No. ANTP 164P
Type of Corer Piston - sand
Length of Barrel 30 ft.
Am't Free Fall 15 ft.
Length of Trip Wire 45 ft.
Piston orifice ⅛" - no screen
Type of Core Nose Sand-gravity type
External Penetration 26'9"

LENGTH OF CORE SECTIONS (in cm)

1 (Bottom)	150 cm	6	cm
2	150 cm	7	cm
3	150 cm	8	cm
4	100 cm	9	cm
5	cm	10	cm

TOTAL CORE LENGTH 550 cm
Catcher? No

Description of Sample: Brown mud, badly washed and disrupted, overlying gray mud rest of core.

Condition of Sample (incl. disturbance; size and position of water pockets, etc.): Section 4- liner split badly - taped together to hold core; Sect. 3 has small crack near upper end.

Equipment Function (incl. parts malfunction, liner condition, defective equipment, etc.): Pistn apparently didn't separate properly- stayed in core barrel after liner removed. Shear pin was bent- nearly 90°- but after fit sheared away. Catcher beginning to show wear.

APPENDIX E

Visual Core Description Form

(Scripps Institution of Oceanography Sample)

1. The form offered here is designed to record core information obtained from visual observation only, and therefore does not provide for compositional information which will be based on microscopic examination of smear slides, and recorded on separate forms. This form is largely self-explanatory, and therefore only a few comments need be made.

2. The person describing the cores must first decide which lithologic units or color zones he wishes to use in the description, and enter the centimeter intervals opposite the line dividing the rows.

3. When the boundary can be specified only approximately, this is indicated by a wavy dash (~) before the number of centimeters, and that degree of uncertainty is assumed to apply all the way across the row.

4. If lithologic units are used, each should include no more than two or three color zones (to be indicated in the "dominant color" and adjacent "Interval" columns).

5. Colors are to be indicated by the Munsell number-and-letter notations. (Note: the research institution should provide rock and soil charts as standards.)

6. Photographs should be provided to act as standards for the use of the terms "great", "moderate", and "slight" when describing degrees of mottling.

7. Mottles are to be described as due to burrowing only when this origin is clearly evident.

8. The attitude of an oblique basal contact is to be given in degrees from the horizontal.

9. The compositional nature of nodules and the presence and nature of other megascopic components should be entered in the "Remarks" column.

10. If there is a catcher sample preserved, it should be described in a separate row.

Visual Core Description Form (cont'd)

SIO VISUAL CORE DESCRIPTION

Exped & Core No. _____ Total Core Length _____ cm Catcher? _____ Observer _____ Date _____

Core interval in cm	COLOR			MOTTLING				LAYERING/BEDDING					BASAL CONTACT		Mn NODULES			REMARKS (include here rocks, megafossils, any artificial disturbance, etc.)
	Dominant	Subdivisions: Interval (cm)	Subdivisions: Color	Interval (cm)	Color	Degree: G=Great M=Moderate S=Slight	Type: B=Burrow U=Unknown	Interval (cm)	Color	Parallel (Thickness in mm)	Cross bedding (Thickness in mm)	Graded Bedding: Grain size at base*	S=Sharp G=Gradational	H=Horizontal Ob=Oblique (incl.°) I=Irregular	Interval (cm)	Number	Size (mm)	

*For grain size at base:
SLT=Silt
Sd=Sand (F=fine, M=medium, C=Coarse)
Sd +=Coarser than sand

SIO 1/69

(Sample form, substantially reduced from 11" x 14" original.)

APPENDIX F

SIO Smear Slide and Paleontology

Exped., core no., and sample depth (cm) _____

Observer _____ Date _____

Estimated percentages by weight

Zeolite	Shards	Other inorg. mineral	Forams	Calc. nannopl.	Diatoms	Radio-laria	Sponges	Other (see Remarks)

Remarks: (including sediment type if desired)

Age assignment from smear slide?

Observer _____ Date _____

Fossils on which it is based:

Age assignment based on fossil separation?

Observer _____ Date _____

Fossil group used: _____ Preservation _____

Taxa on which age assignment is based:

Remarks on fossil preparation (abundance, other constituents, etc.):

APPENDIX G

Record of Sampling and Investigations

SIO GEOLOGICAL SAMPLE RECORD

Working X Sample No. WAH - 7 PG

OR

Archive _____ Total Length or Size 138 cm

Sample interval and date		Recipient and Purpose		*Results: Published-1 Unpublished-2	
10 Jun 1966	10 Jun 1969	Riedel RAD.	Parker FORAM.	② SIO	² SIO
10 Jun 1966		Heath Mineralogy		① THESIS	

* For published results, enter publication data on reverse side.
For unpublished, enter location of results.

ABSTRACT

To ensure maximum usefulness of collected data and materials, the geological curatorial staff of a research institution designs and establishes appropriate procedural standards for its collectors. A uniform system of documentation and labeling is essential to avoid confusion as to the nature and origin of the samples. Precise identification is made possible by the use of prescribed designations - usually in abbreviated form - for the names of expeditions; ships, where more than one is involved; and type and number of sample (e.g., 30P for the thirtieth sample taken during a cruise, in this case a piston core). The original designations should be used to refer to the sampled materials in all reports of findings.

Contamination of samples can be avoided by adherence to standard methods of handling, packaging and sampling, particularly of sediment cores; and by effective protective storage at sea and ashore. After appropriate labeling, gravity cores are stored vertically in their liners, to prevent mixing, with the upper end of each clearly identified. Piston cores are stored horizontally. Pre-marked liners may be used (marked longitudinally) so that segments can later be oriented to one another. Piston cores are cut into uniform lengths of 150 cm as they are extended from the bottom of the barrel. Each section is labeled as to position and length with the bottom of the core designated as Section I.

Precise records - such as log sheets, smear slides, and visual core descriptions - should be kept. Writing must be legible and, for uniformity, times should be logged in Greenwich Mean Time and lengths given in centimeters. After a cruise, the original records and materials are turned over to the curatorial staff, with an occasional period of "prior claim" and restricted access allowed a collecting scientist to give him time to publish on his findings. Logbooks are checked in at home port and then centrally stored, as in an institutional library. As the data are received, the curatorial staff sets up an information system to provide general information of the greatest use to the largest number of researchers; it employs the most efficient method available to its institution for the handling and dissemination of working descriptions of materials and of the records of investigations. For the system to be of value, it is essential that full and available information be provided the curatorial office.